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THREE ANCIENT PERUVIAN GAUZE LOOMS

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Gauze weaves have an appreciable antiquity in Peru, certainly far more than any period yet demonstrated for Mexico or Central America. Gauze and its allied product, leno, were part of the repertoire of Chavin weavers certainly well back in the 9th century B.C., as indicated by finds at the site of the Huaca Prieta on the North Coast. Moreover, the basic movements of woven gauze warps, crossed and transposed, are closely allied to the transposition of warps in decorated weft-twined fabrics made of cotton in the third millenium B.C. of the Pre-Ceramic Period on the Peruvian coast.

In the centuries just before Christ, large and complex gauzes and lenos became popular with Paracas weavers, often depicting the mythological creatures of their religion. From then up to the Spanish conquest, gauzes served a wide range of functions, varying greatly in nature and texture, reflecting the differences in the yarns created for their manufacture. Outstanding for lovely texture and resilience are the Chancay style Late Intermediate Period veils or head cloths made of fine crepe-spun cotton, frequently patterned and made with varied finger-controlled movements.

One cannot possibly do justice to Peruvian gauzes in a brief article. Our purpose here is simply to put on record notes on three small archaeological looms, presumably made as tomb offerings. While they shed no light on procedures for the more complex products, they do reveal that simple heddle controls served for the basic transposition and crossing of warps for the simplest gauze construction, similar to techniques that have survived in Guatemala.

These looms are part of a larger class of sample looms that seem to have been made specifically as grave offerings. They are small in size and the sticks used are not well finished, nor do they show signs of much use. Often some or all of the sticks have been removed, leaving only the loose heddle lacings. Some combine different techniques or types of design, to produce a sampler effect, while others have only a single technique or design system. These looms are most commonly found in Central Coast graves of the Late Intermediate Period, although occasional examples from other areas sometimes occur. Their chief fascination is the clue they offer to the actual weaving processes of the long-dead cultures they represent. For this reason Junius Bird has had a long-standing interest in them, and has analyzed and recorded the remarkable collection of looms at the American Museum of Natural History where he is Curator.[1]

Early scholars such as Raoul d'Harcourt and Lila O'Neale analyzed and classified the various types of Peruvian gauzes as well as could be done without benefit of actual looms.[2] O'Neale even provides an appendix indicating how the different types of gauzes could have been woven on the type of simple applied-heddle loom that was used in Peru, but she admits that her suggestions are pure guesswork. Her instructions are for a loom set up to weave plain weave, although many other options are available, as indicated in the accompanying Pancake and Baizerman article on Guatemalan gauze weaving. The three looms presented here at last provide a clue to which method was chosen, at least for the simplest type of gauze weave.

The three gauze looms are Central Coast in origin, two said to be from Chancay,[3] and the other without provenience. The latter differs in some respects from the others, and may belong to the Lima-Rimac culture area instead of Chancay. All of them have the same gauze structure,

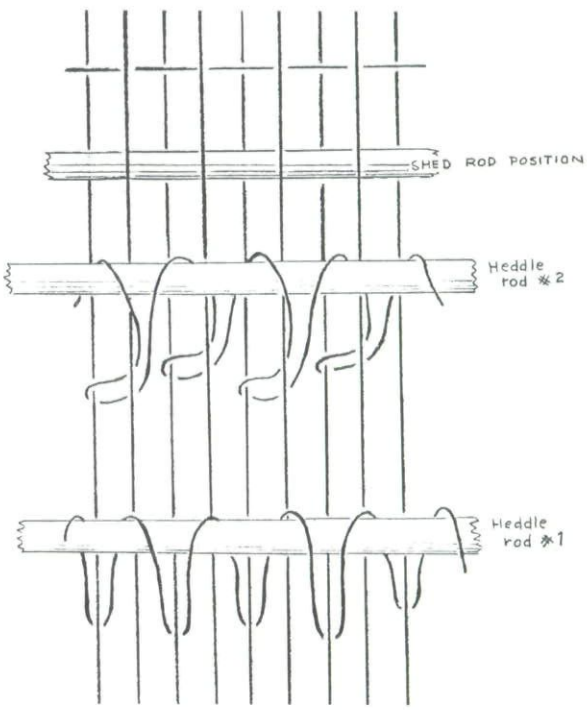


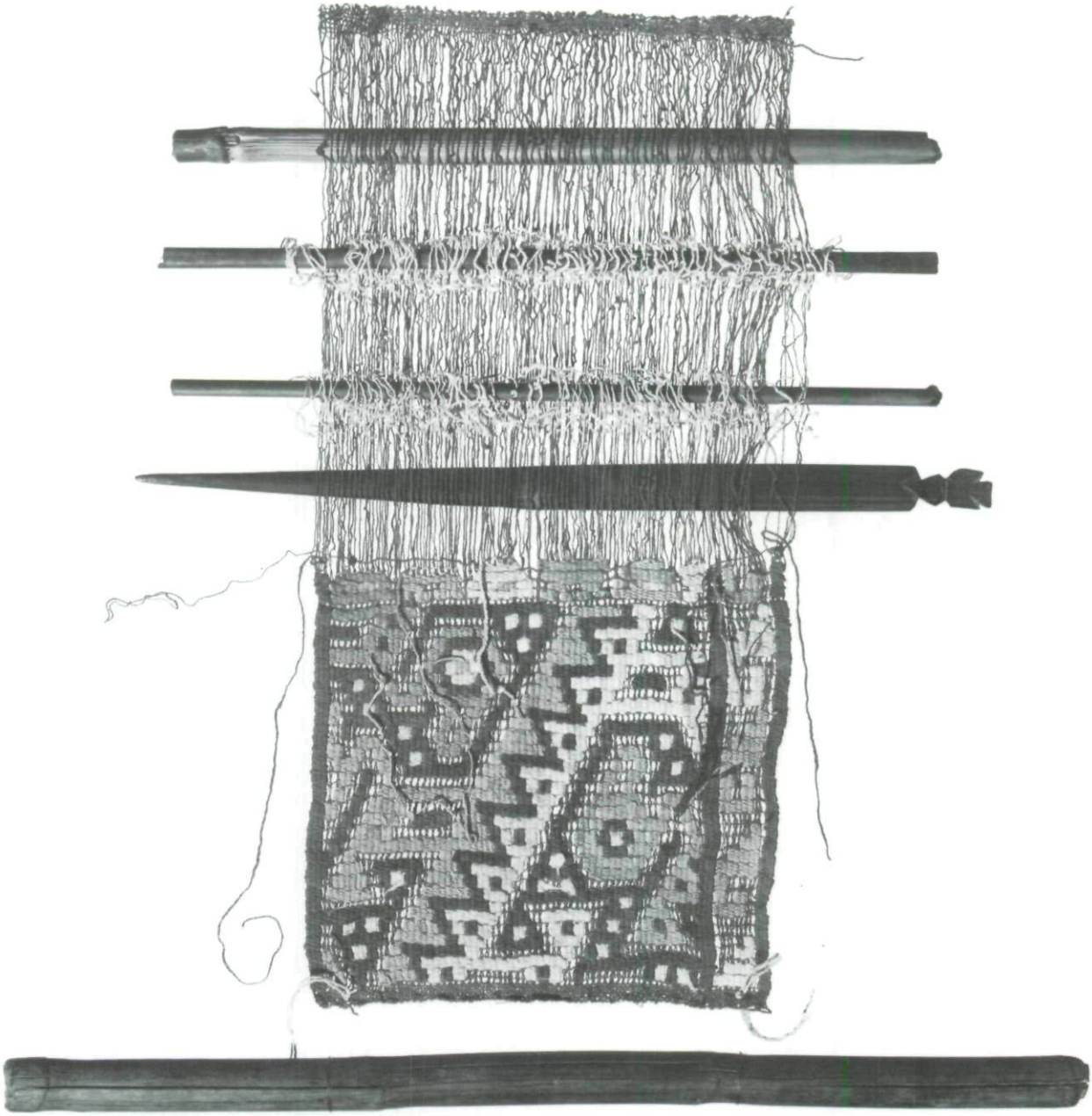
Fig. 1 Diagram of the arrangement of the heddles used to produce plain gauze on the Peruvian looms. This diagram shows the appearance of the heddles when the warps are stretched under tension, in contrast to the following diagrams which show the warps relaxed. Drawing by Milica D. Skinner.

plain (simple) gauze weave with supplementary wefts interlaced over and under each group of two warps that cross in the gauze weave. Contrary to O'Neale's reconstruction of how plain gauze might have been woven, all three looms have special heddles which form the gauze crosses (Fig. 1). A normal heddle arrangement performs the recrossing, so that the gauze weave is produced by alternating the use of the two heddle rods.

This arrangement of heddles is similar to that commonly used in the Alta Verapaz area of Guatemala for textiles that combine plain weave and gauze, as described by Pancake and Baizerman. In the Guatemalan textiles, however, a shed stick

Fig. 2 Gauze loom as received. Said to be from Chancay. American Museum of Natural History 41.2/5479.

Fig. 3 Gauze loom in Fig. 2 as restored by Milica D. Skinner. Warp length: 32 cm., width: 15 cm.



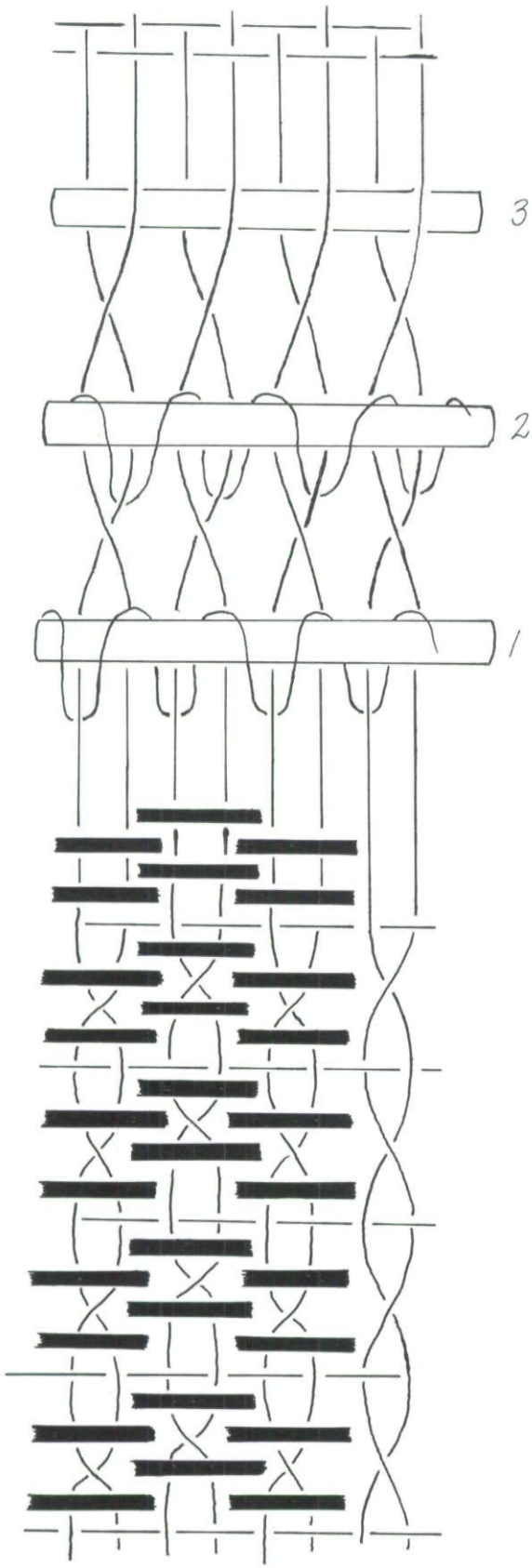


Fig. 4 Diagram of the loom in Fig. 2, with the warps relaxed. 1. plain heddle rod, 2. gauze heddle rod, 3. shed rod (restoration). Drawing by Ann P. Rowe.

is inserted into the crossed-warp shed at the beginning of each gauze section and is used to form subsequent crosses in that section. Since two of the Peruvian looms incorporate 1/1 plain weave only in the headings, it seems unlikely that they would have been equipped with a gauze heddle rod at all if this Guatemalan technique were used. It therefore appears that the Peruvian method is a distinct variation. To weave fabrics that are entirely of gauze except for the heading, Guatemalan weavers use a different method, alternating a gauze heddle rod with the shed rod. The method of constructing the heddle loops in the Peruvian looms is similar to Guatemalan practice.

The method of producing the pattern in these looms is noted in only one unusual example in Guatemala. Apparently by analogy to European practice, both d'Harcourt and O'Neale assumed that the decoration on the finished examples they had seen was embroidered rather than woven.[4] The looms are therefore also important in establishing the method used for the patterning as well as that used for the gauze weave itself. Apart from these basic similarities, the Peruvian looms have some minor but interesting differences in detail.

The loom in Figure 2 was the first to come to the attention of Junius Bird, since it was acquired by the American Museum in 1961. It arrived at the Museum with only its lower loom bar loosely attached and a pointed weaving tool thrust carelessly among the warps, plus the two heddle lacings. All of the other sticks had been removed. If a separate heavy heading cord had been used as appears in the other two looms, it too had been removed in antiquity. The loom was restored with meticulous, patient skill by Milica Dimitrijevic Skinner. Since the heddle lacings survived, new heddle rods (and a shed rod) could be accurately added while the broken warps were being repaired. Before and after photographs are shown in Figs. 2 and 3, and an exact record of what was done is on file at the American Museum.

Only the heading at each end of the loom has 1/1 plain weave interlacing, with six shots on the patterned end of the fabric and eight shots on the opposite end. The shed rod included in the restoration could have been used to weave these sections, along with the first of the two heddle rods, but would not have been needed for any of the rest of the weaving. Whether the shed rod was left in the loom or removed after the headings were woven is impossible to say.

The heddle rods control the left warp in each group of two in the gauze crosses (Fig. 4). In this respect it differs from the loom in Figs. 5

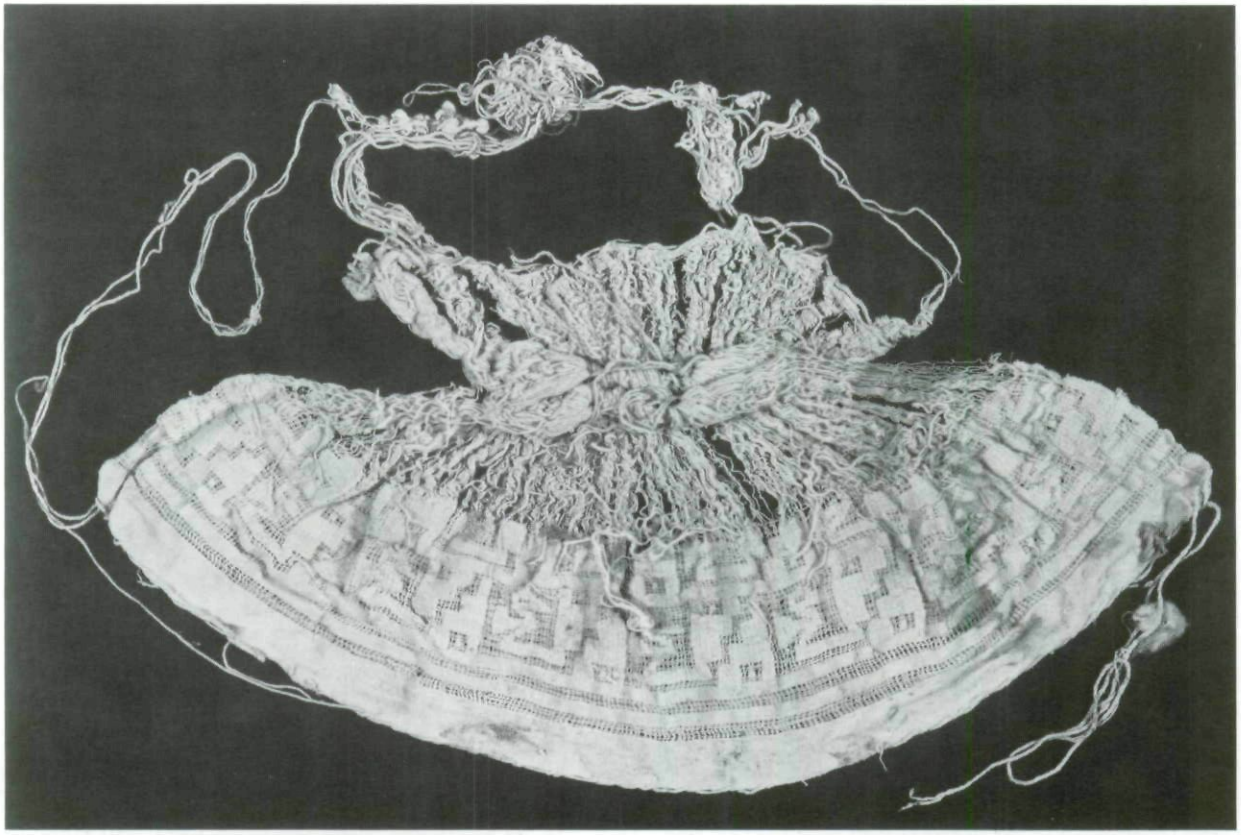


Fig. 5 Gauze loom. Said to be from Miraflores, Chancay Valley. Warp length: 25 cm., width: 52 cm. Photograph by Raymond Schwartz. Textile Museum 1969.51.14.

and 6 where it is the right warp that is controlled. The pointed tool would have been ideal for the purpose of aiding the transference of the gauze warp crosses from behind to in front of the regular heddle rod. The supplementary wefts that interlace 2/2 were evidently inserted without loom controls, though likely with the aid of the pointed tool. 8-13 supplementary wefts are inserted between the gauze wefts although 11 is the usual number. They are closely packed to form a weft-faced effect. It may be noted that the weaver did not finish adding all of the supplementary wefts after the last gauze weft on the left side.

The textile is made entirely of cotton with dark brown warps and gauze wefts, and supplementary wefts in dark brown, grey, white, and an orangish color. The yarns are all 2-ply, with the ply in the S direction except for the warps which are Z-plied. The warps also have a harder twist than the wefts. There are 12 warps and 3 gauze wefts per centimeter (actually 14 gauze wefts in 5 cm.).

The second Chancay loom (Figs. 5-6) was acquired in 1969 by the Textile Museum in the condition shown in Fig. 5. All the sticks had been removed, although the cords which originally bound the piece to the loom bars are still present, spiralling around a heading cord which is considerably heavier than the rest of the wefts. The ends of both cords extend beyond the side edges of the piece as can be seen in the photograph. It is probable that the method of attachment to the loom bars was comparable to that of the loom in Fig. 7 and that both cords would have been removed from a finished fabric. The heddle rods fortunately were replaced by cords, the ends of which are tied so tightly that the unwoven warps are bunched together. Since this method of securing the heddle loops is interesting and seldom found, no attempt has been made to restore this loom. A lease cord is also present above the two heddle lacings, probably marking the place for a shed rod.

On the patterned end of the piece, the weaving begins with 2 cm. of 1/1 weft-faced plain weave using paired single-ply wefts. Two additional plain-weave weft stripes (with wefts used singly) appear above, separated by stripes of gauze weave.[5] The shed rod and the first heddle rod would have been used to weave these bands. The supplementary wefts, interlacing 2/2, again seem to have been inserted without loom controls.

The piece is woven entirely of white cotton. The warps and gauze wefts are 2-ply, with the ply in the S direction. There are 10 warps per cm. and 7 wefts per cm. in the gauze weave areas (17 in 2.5 cm.). The supplementary wefts are similar but larger and more loosely twisted, 4-8

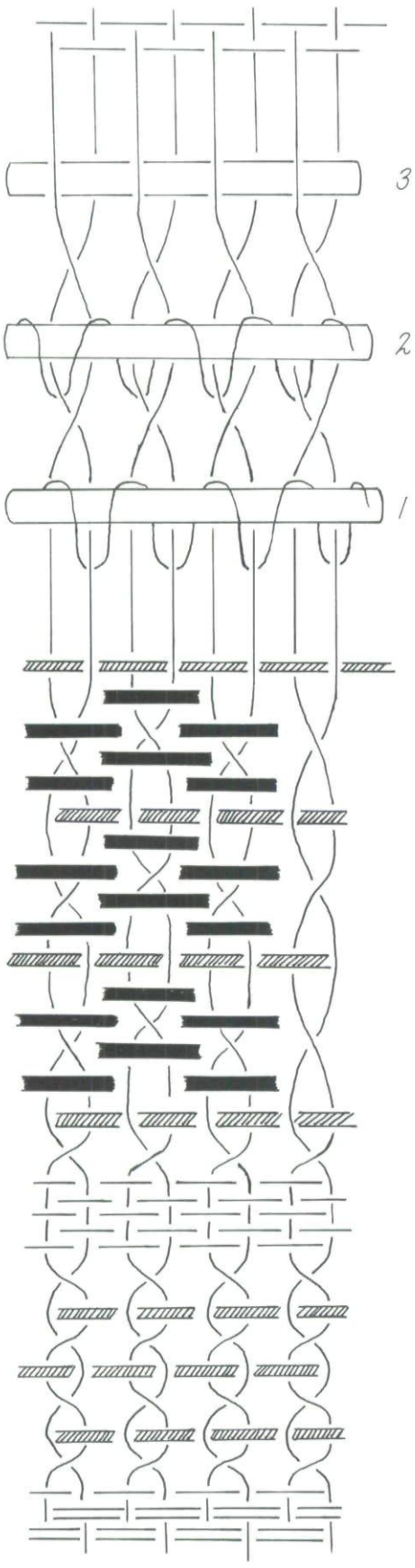


Fig. 6 Diagram of the loom in Fig. 5, with the warps relaxed. 1. plain heddle rod, 2. gauze heddle rod, 3. lease cord (shed rod). Drawing by Ann P. Rowe.

being used between the gauze wefts. The weft-faced stripes are woven of Z-spun singles, with 30 pairs per cm. in the first stripe and 30 singles per .5 cm. in the others.

The third gauze loom was acquired by the American Museum of Natural History in 1979 (Figs. 7-8). It is in remarkably good condition and no restoration work has been done on it. Both loom bars and all heddle rods are still attached. All are of *caña brava*. The heddle rods are 25.5 cm. long and .4 cm. in diameter. In addition to the heddle loops themselves, there is a heavy cord which is wound and tied around each end of the heddle stick passing over the loops, secured with a double overhand knot or granny, thus preventing the loops from slipping off accidentally.

The loom bars are 27.5 cm. long and 1-1.2 cm. in diameter. At the lower (patterned) end of the loom, the first weft is considerably heavier than those used in the rest of the heading and it extends beyond the sides of the fabric, passing around the end of the loom bar (held in place by the rough edges on the ends of the stick) and then wrapping spirally around the stick near the ends to secure it. The lashing cord is tied to the heading cord at each end where it is wound closely around the bar (again with the granny knot). There are five 1/1 plain-weave wefts after the heading cord and before the first gauze wefts. The upper loom bar is bound on in a similar way but the fabric differs, since the warps do not turn at the end but are broken. There are ten plain-weave wefts below the heading cord and a few further wefts beyond it, after which the warps are broken.[6] That is, the plain weaving was interrupted for the insertion of the heavier weft to be used as the heading cord. The broken warps and the presence of the additional wefts means that this weaving would have had to have been done before the present loom bar was attached (whereas headings are usually woven after attachment to the loom bars) and that the binding on of the loom bar would have had to have been done with a needle. The most likely explanation for this peculiar practice is that the warps for two such looms were prepared at once and then cut apart, presumably a short cut reserved for tomb offerings.

This loom has three heddle rods instead of only two, with the first one creating one of the sheds for the 2/2 supplementary wefts, and the other two creating the sheds for the gauze weave as in the other looms. The left warp of the two in each gauze cross is the one controlled by the heddle rods as in the loom in Fig. 4, but the appearance of the upper part of the diagram in Fig. 8 differs because the last shed that has been

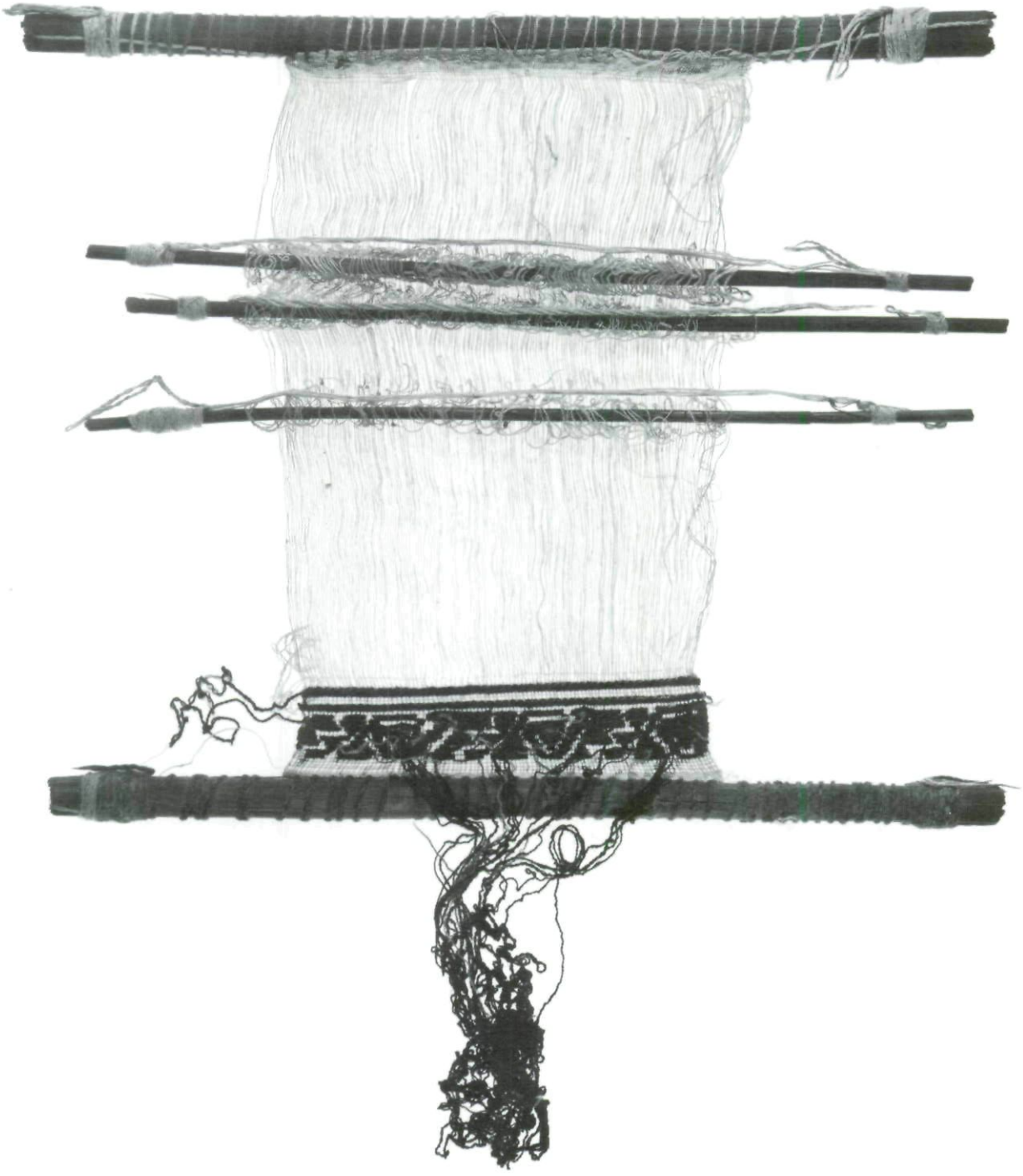


Fig. 7 Gauze loom. Central Coast. Warp length: 24 cm., width 15 cm. American Museum of Natural History 41.2/7655.

woven is the gauze shed rather than the plain shed which recrosses the warps. It is possible that a shed rod was used to create the shed opposite to the 2/2 shed of the first heddle rod. It could either have been inserted immediately behind the 2/2 heddle rod after each gauze weft and removed before the next gauze weft or else inserted behind all the heddle rods and left in place.

The yarns and weaving of this loom are somewhat finer than in the Chancay looms. The warps and ground wefts are of white cotton, 2-ply with the ply in the S direction. There are 20 warps and 7 gauze wefts per cm. (17 in 2.5 cm.). The supplementary wefts are of camelid hair, probably alpaca, predominantly dark brown, although a small amount of red and yellow are also used. These yarns are also 2 plied-S, though more loosely, as is typical of all alpaca yarns of this period commonly found on the coast. 4-6 shots of supplementary weft are used between the gauze wefts. The horizontal stripes are formed

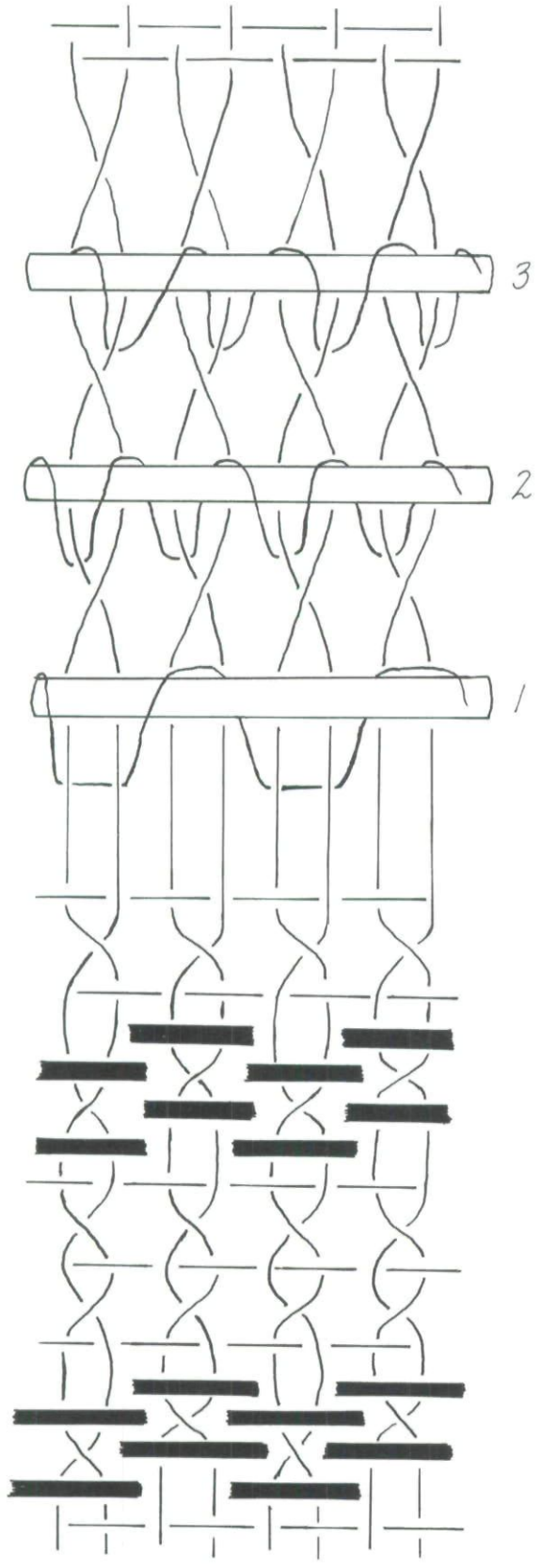


Fig. 8 Diagram of the loom in Fig. 7, with the warps relaxed. 1. heddle rod for insertion of supplementary wefts 2/2, 2. plain heddle rod, 3. gauze heddle rod. Drawing by Ann P. Rowe.

of these 2/2 supplementary wefts in contrast to the Chancay loom in Figs. 5 and 6. The ends of these yarns are quite long and simply hang loose, as can be seen in Fig. 7.

The heddle controls which create the gauze crosses on these sample looms produce, of course, only the simplest gauze structure. These looms suggest, however, that some other types of gauzes may also have been woven with heddle controls, as is the case, for example, for complex alternating gauze in the Alta Verapaz area of Guatemala, although no such looms from Peru have yet come to light. As an illustration of how far this technique may be carried, it may be noted that gauze weave *quexquemitls* in the Cuetzalan area of Mexico are woven on the backstrap loom using as many as twenty heddle rods to create different gauze structures and different combinations of gauze and plain weave. Nevertheless, when the design changes in diagonal rows, as is often the case in the more complex Peruvian gauze weave textiles, a certain amount of hand picking is essential.

NOTES

1. J.B. Bird and M.D. Skinner, "The Care and Conservation of Ethnological and Archaeological Backstrap Looms," *Curator* VII: 2 (1964), pp. 99–120. M.D. Skinner, "Archaeological Looms from Peru in the American Museum of Natural History Collection," *Irene Emery Roundtable on Museum Textiles, 1974 Proceedings, Archaeological Textiles*, The Textile Museum, 1975, pp. 67–76.

2. R. d'Harcourt, *Les textiles anciens du Pérou et leur techniques*, Paris, 1934, English translation and expanded edition, *Textiles of Ancient Peru and their Techniques*, University of Washington Press, Seattle, 1962, pp. 50–53, pls. 33–39. L.M. O'Neale and B.J. Clark, Textile Periods of Ancient Peru, III: The Gauze Weaves, *University of California Publications in American Archaeology and Ethnology* 40: 4 (1948), pp. 143–222, pls. 3–22.

3. A piece which appears to be similar to that in Figs. 2-3, with Lauri, Chancay provenience, is published in I. VanStan, *The Fabrics of Peru*, Leigh-on-Sea, 1966, pl. 26 (detail). This piece has alpaca supplementary wefts rather than cotton, however.

4. Harcourt 1962, *op. cit.* (note 2), p. 53; O'Neale, *op. cit.* (note 2), p. 161.

5. A fragment of closely similar construction, and apparently also woven entirely of white cotton, is published by W. Reiss and A. Stübel, *The Necropolis of Ancon in Peru*, Berlin 1880–87, vol. II, pl. 71a. It is a border, 20 cm. deep, with the warps running in the short direction, perpendicular to the fabric to which the border is sewn. The caption wrongly identifies the warp direction and as a result the technical description is nonsensical. The border has three bands of plain gauze patterned with supplementary wefts interlacing 2/2, separated by ten weft-faced plain-weave bands interlacing 1/1 and six narrow plain gauze bands. Two different bird designs appear in the patterned bands.

6. The presence of broken warps at the upper loom bar is sufficiently unusual that initially the binding might be considered a modern restoration. However, the presence of the heading cord in the weaving and the accumulation of decomposed cotton and salt traces on the lashing cord (as noted by Milica Skinner) indicate that the binding is ancient.

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